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comprises a structural supermotif associated with peptide binding to multiple HLA molecules, said structural supermotif comprising a first amino acid anchor residue at a position two from the epitope's amino-terminal amino acid residue, said first anchor residue consisting of P, and a second amino acid anchor residue selected from the group consisting of V, I, L, F, M, W, Y, and A as the epitope's carboxyl-terminal amino acid residue;

wherein the immunogenic peptide induces a cytotoxic T cell response when in complex with an HLA molecule and is contacted with an HLA-restricted cytotoxic T cell.

- 9. The nucleic acid of claim 8, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is more than about 11 amino acid residues in length.
- The nucleic acid of claim 9, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is about 8, 9, 10, or 11 amino acid residues in length.
- 11. The nucleic acid of claim 8, wherein the nucleic acid encodes a homopolymer comprising at least one additional peptide, wherein the additional peptide has the same sequence as the immunogenic peptide.
- 12. The nucleic acid of claim 8, wherein the nucleic acid encodes a heteropolymer encoding at least one additional peptide.
- The nucleic acid of claim 12, wherein the additional peptide comprises a T helper epitope.
- The nucleic acid of claim 12, wherein the additional peptide comprises a CTL epitope.

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15. The nucleic acid of claim 12, wherein the additional peptide is non-naturally occurring.

- 16. The nucleic acid of claim 8, wherein the immunogenic peptide is non-naturally occurring.
- The nucleic acid of claim 8, wherein the HLA molecule is selected from the group consisting of: HLA-B1801, HLA-B0801, HLA-B2705, HLA-B4403, HLA-B3502, HLA-B4001, HLA-B1302, HLA-B0701, HLA-B1401, HLA-B3501, HLA-B3503, HLA-B5101, HLA-B5301, HLA-B5401 and HLA-Cw6 molecules.
- 18. The nucleic acid of claim 8, wherein the immunogenic peptide is derived from a cancer-associated antigen.
- 19. The nucleic acid of claim 18, wherein the immunogenic peptide is derived from a HER2/neu antigen, a p53 antigen, a MAGE antigen, a CEA antigen, or a prostate antigen.
- 20. The nucleic acid of claim 8, wherein the immunogenic peptide is derived from an antigen that is derived from a pathogenic agent.
- 21. The nucleic acid of claim 20, wherein the immunogenic peptide is derived from an HIV antigen, an HBV antigen, an HCV antigen, an HPV antigen, or a malaria antigen.
- The nucleic acid of claim 8, wherein the immunogenic peptide is immunogenic in vitro and/or in vivo.

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- 23. The nucleic acid of claim 8, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 500 nM for an HLA molecule.
- 24. The nucleic acid of claim 23, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 50 nM for an HLA molecule.
- 25. The nucleic acid of claim 8, wherein the nucleic acid encodes the immunogenic peptide linked to a carrier peptide.
- 26. The nucleic acid of claim 8, wherein the immunogenic peptide is selected from the peptides of Tables 5, 6, or 7, and the immunogenic peptide has an IC₅₀ of less than about 500 nM for an HLA molecule.
- 27. The nucleic acid of claim 8, wherein the nucleic acid comprises a viral vector.
 - 28. An isolated nucleic acid molecule comprising:

a nucleic acid encoding a non-naturally occurring immunogenic peptide, said immunogenic peptide comprising an epitope consisting of about 8-11 residues which comprises a structural supermotif associated with peptide binding to multiple HLA molecules, said structural supermotif comprising a first amino acid anchor residue at a position two from the epitope's amino-terminal amino acid residue, said first anchor residue consisting of P, and a second amino acid anchor residue selected from the group consisting of V, I, L, F, M, W, Y, and A as the epitope's garboxyl-terminal amino acid residue;

wherein the immunogenic peptide induces a cytotoxic T cell response when in complex with an HLA molecule and is contacted with an HLA-restricted cytotoxic T cell.

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29. The nucleic acid of claim 28, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is more than about 11 amino acid residues in length.

- 30. The nucleic acid of claim 29, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is about 8, 9, 10, or 11 amino acid residues in length.
- 31. The nucleic acid of claim 28,/wherein the nucleic acid encodes a homopolymer comprising at least one additional peptide, wherein the additional peptide has the same sequence as the immunogenic peptide.
- 32. The nucleic acid of claim 28, wherein the nucleic acid encodes a heteropolymer encoding at least one additional peptide.
- The nucleic acid of claim 32, wherein the additional peptide comprises a Thelper epitope.
- The nucleic acid of claim 32, wherein the additional peptide comprises a CTL epitope.
- 35. The nucleic acid of claim 32, wherein the additional peptide is non-naturally occurring.
- 36. The nucleic acid of claim 28, wherein the HLA molecule is selected from the group consisting of: HLA-B1801, HLA-B0801, HLA-B2705, HLA-B4403, HLA-B3502, HLA-B4001, HLA-B1302, HLA-B0701, HLA-B1401, HLA-B3501, HLA-B3503, HLA-B5101, HLA-B5301, HLA-B5401 and HLA-Cw6 molecules.

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- 37. The nucleic acid of claim 28, wherein the immunogenic peptide is derived from a cancer-associated antigen.
- 38. The nucleic acid of claim 37, wherein the immunogenic peptide is derived from a HER2/neu antigen, a p53 antigen, a MAGE antigen, a CEA antigen, or a prostate antigen.
- 39. The nucleic acid of claim 28, wherein the immunogenic peptide is derived from an antigen that is derived from a pathogenic agent.
- 40. The nucleic acid of claim 39, wherein the immunogenic peptide is derived from an HIV antigen, an HBV antigen, an HCV antigen, an HPV antigen, or a malaria antigen.
- 41. The nucleic acid of claim 28, wherein the immunogenic peptide is immunogenic *in vitro* and/or *in vivo*.
- 42. The nucleic acid of claim 28, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 500 nM for an HLA molecule.
- 43. The nucleic acid of claim 42, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 50 nM for an HLA molecule.
- 44. The nucleic acid of claim 28, wherein the nucleic acid encodes the immunogenic peptide linked to a carrier peptide.

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- 45. The nucleic acid of claim 28, wherein the immunogenic peptide is selected from the peptides of Tables 5, 6, or 7, and the immunogenic peptide has an IC₅₀ of less than about 500 nM for an HLA molecule.
- 46. The nucleic acid of claim 28, wherein/the nucleic acid comprises a viral vector.
- 47. An isolated nucleic acid molecule encoding a homopolymer or a heteropolymer, said nucleic acid molecule comprising:

a nucleic acid encoding an immunogenic peptide, said immunogenic peptide comprising an epitope consisting of about 8-11 residues which comprises a structural supermotif associated with peptide binding to multiple HLA molecules, said structural supermotif comprising a first amino acid anchor residue at a position two from the epitope's amino-terminal amino acid residue, said first anchor residue consisting of P, and a second amino acid anchor residue selected from the group consisting of V, I, L, F, M, W, Y, and A as the epitope's carboxyl-terminal amino acid residue;

wherein the immunogenic peptide induces a cytotoxic T cell response when in complex with an HLA molecule and is contacted with an HLA-restricted cytotoxic T cell; and wherein the nucleic acid further encodes at least one additional peptide.

- The nucleic acid of claim 47, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is more than about 11 amino acid residues in length.
- 49. The nucleic acid of claim 48, wherein the immunogenic peptide, which comprises an epitope bearing a structural supermotif, is about 8, 9, 10, or 11 amino acid residues in length.
- 50. The nucleic acid of claim 47, wherein the nucleic acid encodes a homopolymer and the additional peptide has the same sequence as the immunogenic peptide.

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51. The nucleic acid of claim 47, wherein the nucleic acid encodes a heteropolymer and the additional peptide comprises a T helper epitope.

52. The nucleic acid of claim 51, wherein the additional peptide comprises a CTL epitope.

53. The nucleic acid of claim 51, wherein the additional peptide is non-naturally occurring.

54. The nucleic acid of claim 47, wherein the immunogenic peptide is non-naturally occurring.

55. The nucleic acid of claim 47, wherein the HLA molecule is selected from the group consisting of: HLA-B1801, HLA-B0801, HLA-B2705, HLA-B4403, HLA-B3502, HLA-B4001, HLA-B1302, HLA-B0701, HLA-B1401, HLA-B3501, HLA-B3503, HLA-B5101, HLA-B5301, HLA-B5401 and HLA-Cw6 molecules.

56. The nucleic acid of claim 47, wherein the immunogenic peptide is derived from a cancer-associated/antigen.

57. The nucleic acid of claim 56, wherein the immunogenic peptide is derived from a HER2/neu antigen, a p53 antigen, a MAGE antigen, a CEA antigen, or a prostate antigen.

58. The nucleic acid of claim 47, wherein the immunogenic peptide is derived from an antigen that is derived from a pathogenic agent.

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- 59. The nucleic acid of claim 58, wherein the immunogenic peptide is derived from an HIV antigen, an HBV antigen, an HCV antigen, an HPV antigen, or a malaria antigen.
- 60. The nucleic acid of claim 47, wherein the immunogenic peptide is immunogenic in vitro and/or in vivo.
- 61. The nucleic acid of claim 47, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 500 nM for an HLA molecule.
- 62. The nucleic acid of claim 61, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 50 nM for an HLA molecule.
- 63. The nucleic acid of claim 47, wherein the nucleic acid encodes the immunogenic peptide linked to a carrier peptide.
- 64. The nucleic acid of claim 47, wherein the immunogenic peptide is selected from the peptides of Tables 5, 6, or 7, and the immunogenic peptide has an IC₅₀ of less than about 500 nM for an HLA molecule.
- The nucleic acid of claim 47, wherein the nucleic acid comprises a viral vector.
- An pharmaceutical composition comprising an isolated nucleic acid molecule that encodes an immunogenic polypeptide, said composition comprising:

 a therapeutically effective human dose of a nucleic acid encoding an

immunogenic peptide, said immunogenic peptide comprising an epitope consisting of about 811 residues which comprises a structural supermotif associated with peptide binding to

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multiple HLA molecules, said structural supermotif comprising a first amino acid anchor residue at a position two from the epitope's amino-terminal/amino acid residue, said first anchor residue consisting of P, and a second amino acid anchor residue selected from the group consisting of V, I, L, F, M, W, Y, and A as the epitope's carboxyl-terminal amino acid residue:

with a proviso that the immunogenic peptide does not comprise an entire native

antigen;

wherein the immunogenic peptide induces a cytotoxic T cell response when in complex with an HLA molecule and is contacted with an HLA-restricted cytotoxic T cell; and a pharmaceutically acceptable excipient.

- 67. The nucleic acid of claim/66, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 500 nM for an HLA molecule.
- 68. The nucleic acid of claim 67, wherein the immunogenic peptide, or a structural supermotif-comprising fragment thereof, comprises an IC₅₀ of less than about 50 nM for an HLA molecule.
- 69. The composition of claim 66, further comprising a human dose of the pharmaceutically acceptable excipient.
 - 70. An isolated nucleic acid molecule comprising:

a nucleic acid/encoding an immunogenic peptide, said immunogenic peptide comprising an epitope consisting of about 8-11 residues which comprises a structural supermotif associated with peptide binding to multiple HLA molecules, said structural supermotif comprising a first amino acid anchor residue at a position two from the epitope's amino-terminal amino/acid residue, said first anchor residue consisting of P, and a second amino acid anchor residue selected from the group consisting of V, I, L, F, M, W, Y, and A as the epitope's carboxyl-terminal amino acid residue;

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